

NOTES ON FELDSPARS AND SOME OTHER MINERALS OF PHILADELPHIA AND VICINITY.

BY THEODORE D. RAND.

Orthoclase, from the ravine three-quarters of a mile west of Media, the locality mentioned in Dana's Mineralogy as Mineral Hill. Color pale-greenish, two cleavages highly perfect, giving a prism four inches, by one and a half, by one and a half, 90°. Four other specimens from the same locality, one quite green, the others grayish and greenish, all with two perfect cleavages, 90°.

Oligoclase, from same locality, and intermixed with the former and with quartz, but showing opalescence, and sometimes chatoyant reflections, and, rarely, both on the same surface, the brachy-diagonal cleavage $\infty P \tilde{\infty}$. These cleavages were by no means so perfect as in the former, and but few specimens would admit of accurate measurements. The basal plane generally showed distinct but very fine striae. The measurements are given below.

Oligoclase, from two miles west of Media, and southwest of the Black Horse Hotel. This is the whitish, translucent moonstone, occurring in very brilliant specimens. In this, as in the former, the cleavage surface parallel to $\infty P \tilde{\infty}$ is frequently irregular and sometimes curved. There was also observed, in both this and the former, a third cleavage, still more imperfect. The measurements (with the common goniometer) were as follows:—

	Oligoclase,	1	2	3	4	5	6	7	8
0P on $\infty P \tilde{\infty}$ {	93.50	93	...	...	94	95	...	94	...
	86.10	87	88	...	87	...	86	87	...
0P on 3d cleavage {	(If $\infty P'$ 114.40)	...	...	...	112	111	113	115	114
	65.20	...	67	67	69	70	68	...	65
$\infty P \tilde{\infty}$ on 3d cleav. {	(If $\infty P'$ 120.24)	119	120	...	119	118	120	120	...
	59.56	...	63	...	64	60	63	62	60

1, 2, 3, and 4 are from the ravine near Media; 5, 6, 7, and 8 from near the Black Horse Hotel.

It seems probable that this third cleavage, which has not, I believe, been noticed before, is parallel to the plane $\infty P'$ (I' of Dana), similar to that of orthoclase and albite.

Sunstone, from a ravine immediately north of that first described, 90°. Near this the Delawarite is found. My specimens 1872.]

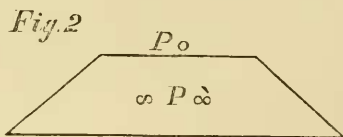
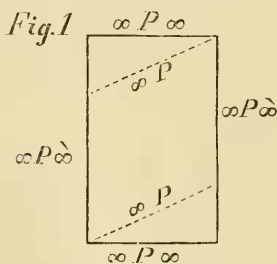
do not admit of accurate measurements, but in one specimen it graduates into oligoclase, and it is perhaps but an alteration of that species. It has distinct triclinic striations.

Cassinite, from Blue Hill, Providence Township, Delaware County, measures 90° .

Lennilite, Lenni, Delaware County, a very perfect cleavage gave 86–87, but the absence of triclinic striae would indicate that this is an orthoclase.

Bluish transparent veined Feldspar, from Van Arsdale's quarry, near Feisterville, Bucks County, Pa., two cleavages, highly perfect, and giving finely polished surfaces, 90° . The opalescent feldspar from the same quarry, called labradorite, is probably the same.

Orthoclase, from Frankford, Philadelphia, nearly pure white in color, and translucent. Besides the ordinary cleavages, $0P$ and $\infty P \infty$, the more unusual, $\infty P \infty$ and ∞P , are occasionally well developed, giving rise to two rhombohedra, one with the faces parallel to the axes, the other derived from this by the development of the plane ∞P , as shown in the annexed section on a plane parallel to $0P$ (Fig. 1). Rhombohedra of the first form have been found also at the quarries on the Pennsylvania Railroad, near the west end of the Fairmount dam.



In three specimens of the Frankford orthoclase, a fifth cleavage appears, quite imperfect, truncating the angle between ∞P , $0P$ and $\infty P \infty$, or the edge between $0P$ and $\infty P \infty$ forming with $0P$ an angle of about 135° , and with $\infty P \infty$ nearly 90° , Fig. 2. If this is not a mere accident, it is not easy to explain.

Rhombs from the quarries mentioned on the Pennsylvania Railroad have been found, with the following angles for the face of unusual cleavage on $0P$ and $\infty P \infty$:—

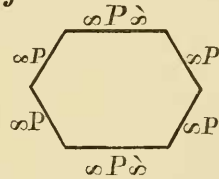
[February 13,

	0P	$\infty P \infty$
1	72	103
2	{ 112 69 }	{ 101 80 }
	{ 114 66 }	{ 100 81 }
3	{ 112 68 }	{ 100 80 }
	{ 116 69 }	{ 107 70 }
4	{ 112 69 }	{ 100 83 }
	{ 107 72 }	{ 103 }
5	111 70	98 81
The angle of $\infty P \infty$ is . .	116 64	90 90

It is, however, most probable that this is a distortion of $\infty P \infty$.

In the cutting of the Pennsylvania Railroad, northwest of the wire bridge, an orthoclase was found, somewhat decomposed and chalky in aspect, cleaving into rhombohedra of the second kind, and also into six-sided prisms, terminated by the 0P plane, and from a slight distortion in angle the prism angles each measuring exactly 120° (Fig. 3).

Fig 3



In Frankford, the orthoclase occurs in a granitic vein on the southern portion of the bed of hard hornblende gneiss, the N. E. outcrop of which is at this point, and which is exposed also near Wayne St. on the Germantown Railroad, and on Rittenhouse Lane near the Wissahicon, and which crosses the Schuylkill at the hill through which the Flat Rock Tunnel on the Reading Railroad is pierced. This gneiss throughout is very hard, and in its fissures occur several species of zeolites, with calcite, and at Frankford crystallized epidote in fine specimens, and also fluor spar in a vein of calcite, and well-crystallized molybdenite in a vein of orthoclase. The calcite contains also yellow crystals so minute as to be detected only by examination with the microscope, of the portion insoluble in hydrochloric acid. Their nature has not been determined, the quantity being very small. There also occurs a yellow hyaline coating, in veins of the gneiss, which is probably a hyalite, colored by uranium.

This gneiss, except near Wayne Station, is bedded with great regularity, and affords a most excellent curb and building stone; its fracture in one direction, owing to cleavage, is smooth and

plane, but in the others, when not jointed, irregular and sometimes conchoidal.

At a quarry on the northern edge of this gneiss, north of Frankford, Apophyllite was found; its only place of occurrence in the neighborhood.

At the line between Philadelphia and Montgomery counties, the well-known steatite bed, beginning on the west side of Chestnut Hill, about three miles distant, crosses the Schuylkill and continues in a nearly southwest by south direction (exactly S. 54 W.), beyond that river about two miles and a half, where it crosses the valley of Mill Creek, and ends, or sinks beneath the surface. Perhaps the most conspicuous and remarkable rock of this belt is a steatite, containing a black serpentine. This rock in many places projects above the surface of the ground in immense masses, particularly at Mill Creek, seeming to have resisted erosion and decomposition to a remarkable degree. It lies on the northwest side of the steatite proper. The whole aspect of this curious formation suggests a rock originally containing crystals of some mineral, but metamorphosed almost beyond recognition. To this mineral I believe no clue has heretofore been obtained. Nearly all these black masses, which vary in size from a half inch or less to several inches, are irregular in form, and adhere so closely to the matrix that sections only can be obtained, which, however, rarely show any angles or other than a nodular form, so that the rock has by some been considered a conglomerate. Even in weathering, the two, except in one place hereafter mentioned, seem to weather so much alike that no clue to the form can thus be had.

About two years ago, however, I found near the soapstone quarry, on the northeast bank of the Schuylkill, one of these serpentine masses presenting a stellated form of six rays, or of one large crystal crossed by two smaller at angles of about 60 and 120 on the section plane, suggesting staurolite. A few days ago, while with Prof. E. J. Houston examining this rock on the southwest side of Mill Creek, a piece was found containing a broken crystal $4\frac{1}{2}$ inches \times $1\frac{1}{2}$ \times $1\frac{1}{2}$, presenting two well-defined sides, and upon a cross-fracture, these sides were found to continue to another forming with one of the sides an angle of about 75° on the section, which approximated a plane at right angles to the

[February 13,

faces. The steatite in which it was imbedded, and the serpentine itself, contained ferruginous dolomite or breunnerite.

On the northeast side of Mill Creek, a portion of the rock in place was found very much weathered on the surface, the steatite being cavernous and decomposed, and very soft and brittle, owing, probably, to a large admixture of ferruginous dolomite, but the serpentine gone entirely, save a little pulverulent oxide of iron; the cavities were nearly all lenticular in shape, but too regular to be other than matrices of crystals, while in two cases distinct cruciform cavities with angles of about 60° were observed. The portions of rock containing these were cut out, and in one of them lead was poured, and a cast obtained, which, while irregular and rough, was a fac-simile in metal of the common cruciform twins of staurolite. Portions of the same rock which had not altered were found containing the serpentine in distinct crystals, irregular in outline, but twinned at angles of about 60° .

Serpentine.—About a half mile above the soapstone quarries on the Schuylkill, occurs a ridge of serpentine which I believe has never been described. Its first appearance is at a slight cutting of the Philadelphia and Reading Railroad, opposite and a little above Lafayette station on the Norristown Railroad, and just below the vein of granite which crosses the Schuylkill below Spring Mill, and crops out at several points on the elevated hill of gneiss, which crosses the Schuylkill at Spring Mills. About a hundred yards S.W. from the river, it has been cut through by a small stream, and here it has been quarried as a building-stone, and is well exposed. The serpentine is very compact, at times slaty, of a very dark green, almost black, color, unlike that of any other ridge of the neighborhood, and resembling that of the Hartz. Intermixed, and also at the bottom of the quarry on the northwest, is a foliated mineral resembling Schiller spar, or serpentine, pseudomorphous after Pyroxene or Hornblende. The serpentine dips steeply toward the southeast, and at this point rises probably one hundred and fifty feet above the valley, abruptly and precipitously on the N.W., sloping on the S.E., where talcose and micaceous schists rest against it. About a half mile from the river, the ridge widens, the slopes are more gentle, and, for a short distance, the serpentine is hidden; but it again crops out about one mile from the river, where a road, parallel to the river, crosses the stream which has been mentioned, and which skirts
1872.]

the ridge on the west. From this point it is narrower and well defined for a quarter of a mile to the next road parallel with the Schuylkill. Here the stream seems to have denuded it for about fifty yards, and a stream from the east joins that on the west. Beyond this it rises abruptly in a grove of cedars, and then continues, as a narrow, well-defined ridge, to its termination, which is abrupt, about one and three-quarter miles from the Schuylkill. In this part, as also in that between the two roads, it has almost the regularity and appearance of an old railroad embankment.

Hisingerite, from the Gap Mine, Lancaster County, Pa. Black amorphous; lustre between resinous and vitreous; streak, brown. Fracture conchoidal, brittle H $2\frac{1}{2}$ -3 S. G. 2.11.

Analysis omitting 1.13 per cent. gangue:—

Water at 212	. . . . .	14.30	
“ at redness	. . . . .	9.89	24.19
Silica	. . . . .		35.40
FeO	. . . . .		12.53
Fe ₂ O ₃	. . . . .		27.46
			99.58

In a cutting through decomposed mica shists, on the new line of the Philadelphia, Wilmington, and Baltimore Railroad, about a half mile southwest of Gray's Ferry, there is a white efflorescence, alkaline to the taste. It consists chiefly of sulphate of soda, an unlooked-for mineral in such location.

PHILADELPHIA, November 21, 1871.

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